

PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

ENERGY DIVISION

RESOLUTION E-4849
June 15, 2017

R E S O L U T I O N

Resolution E-4849. Confirmation of candidates for appointment to the Diablo Canyon Independent Safety Committee (DCISC) for a three-year term beginning July 1, 2017.

PROPOSED OUTCOME:

- The California Public Utilities Commission ratifies the President's selection of three candidates for consideration by the Governor for appointment to the DCISC.

SAFETY CONSIDERATIONS:

- The DCISC reviews operations at PG&E's Diablo Canyon Power Plant (DCPP) for the purpose of assessing the safety of current operations and suggesting recommendations for continued safe operations. The appointed candidate will serve a three-year term on the DCISC.

ESTIMATED COST:

- All ongoing DCISC costs were funded previously. Ratification of the CPUC President's selection of candidates for appointment to the DCISC will not result in any additional costs.

As required by Decision (D.) 07-01-028, dated January 25, 2007.

SUMMARY

The Diablo Canyon Independent Safety Committee (DCISC) consists of three members, each appointed in turn by the California Governor, the California Attorney General, and the Chair of the California Energy Commission (CEC),

serving staggered three-year terms. Section 1.B of the restated charter of the DCISC describes the process for appointment of DCISC members: it requires the CPUC to select and forward to the appointing authority no more than three new candidates plus the incumbent for DCISC membership. The appointing authority for the current cycle is the Governor. This Resolution ratifies the California Public Utilities Commission (CPUC) President's selection of Dr. Per F. Peterson as a candidate for reappointment, and Dr. Ivan Catton and Dr. Michael D. Quinn as candidates for appointment to the DCISC, for a three-year term commencing on July 1, 2017.

BACKGROUND

Establishment of the DCISC and Member Selection Process:

The CPUC created the DCISC in Decision (D.)88-12-083 as part of the overall settlement of ratemaking issues for the DCP, which is owned and operated by Pacific Gas and Electric Company (PG&E). The DCISC is an independent, three-member committee responsible for monitoring the safety of PG&E's operation of DCP. The DCISC's budget is paid out of PG&E's revenues and charged to PG&E's ratepayers.¹ D.88-12-083 established the qualifications and procedures for appointment of members to the DCISC and defined the scope of the Committee's operations and responsibilities.² Membership on the DCISC is a compensated position.³

¹ D.88-12-083, Appendix C, Paragraph 16.

² D.88-12-083, Appendix C, Attachment A.

³ In Resolution E-3152, the Commission established that DCISC member compensation be set at levels commensurate with fees paid by PG&E for comparable services. The compensation levels set in E-3152 have been revised twice, most recently on April 1, 2011 in PG&E's Advice Letter (AL) 3677-E-A. The levels established in that AL have been re-approved every year since 2011, including 2017 on April 3rd in PG&E AL 5044-E. The current compensation levels are as follows: annual retainer of \$10,000; \$250/hour fee for attendance at DCISC meetings; \$250/hour fee for DCISC work performed outside of committee meetings in excess of 40 hours/year; and reimbursement of expenses incurred in performance of DCISC work.

On October 24, 2006, the DCISC submitted Application (A.) 06-10-024 proposing a restated charter. The CPUC adopted the restated charter in D.07-01-028 on January 25, 2007.

Section 1.B of the restated charter describes the process for appointment of DCISC members. It requires the CPUC to select no more than three candidates for DCISC membership from among those applicants responding to an open request by the CPUC for applications. The incumbent member whose term is about to expire is to be deemed an additional candidate if he or she consents. The CPUC is charged with the responsibility to provide for public comment on the applicants' qualifications and potential conflicts of interest. The President of the CPUC is to review the applicants' qualifications, experience, and background, including any conflicts of interest, together with any public comments, and propose as candidates to the appointing authority only persons with knowledge, background, and experience in the field of nuclear power plants and nuclear safety issues. The Energy Division prepares a resolution ratifying the President's selection of candidates for the Commission.

Current Applicants:

On December 12, 2016, an open request for applications to fill the July 1, 2017 vacancy on the DCISC was posted on the CPUC's website⁴.

Applications were timely received from Dr. Ivan Catton and Dr. Michael Quinn. In addition, Dr. Per Peterson, the incumbent member of the DCISC whose term is set to expire, sent a letter to the Energy Division confirming his willingness to continue serving as a member of the DCISC. Dr. Peterson also provided a synopsis of his technical experience and professional activities relating to nuclear reactor design and safety, including his experience as a professor at UC Berkeley,

⁴ A link to the announcement posted on the CPUC's website was sent to the service lists of A.16-03-006 and A.16-08-006 to ensure that parties interested in issues relating to the DCPD were aware of the announcement. A.16-03-006 is PG&E's 2016 Nuclear Decommissioning Cost Triennial Proceeding and A.16-08-006 is the joint proposal to shut down the DCPD.

researcher, and advisor for the federal government, national laboratories, and national academies. Dr. Peterson was originally appointed to the DCISC in 2004 by California Attorney General Bill Lockyer and served that term through 2007; he was appointed again in 2008 by Governor Schwarzenegger and reappointed in 2011 and 2014. Dr. Peterson's fourth term is set to expire on June 30, 2017. In his application, Dr. Catton summarized his fifty years of experience in both research and industrial applications in the field of heat transfer, ranging from aerospace systems to electronic devices and nuclear power plant design, his career teaching thermodynamics, heat transfer, fluid mechanics, and nuclear engineering at UCLA, and his work as director of the UCLA nuclear reactor facility. Dr. Catton also listed his major accomplishments in the field of nuclear safety as well as over 600 scientific papers and publications he has written.

In Dr. Quinn's application, he describes his experience working in the nuclear power industry, and consulting on nuclear operations and safety for industry clients as well as the U.S. and Canadian governments. Dr. Quinn was previously selected by the Commission as one of the qualified candidates for consideration by the Governor for appointment to the DCISC in 2014, and for consideration by the Chair of the CEC for appointment in 2015.⁵

Public Comments on Applicants:

On February 6, 2017, an announcement was posted on the CPUC's website inviting comments on the candidates.⁶ Summaries of their qualifications were included with the announcement. The full text of the public comments is included in Appendix B of this Resolution.

Comments in support of Dr. Peterson's reappointment were submitted by Dr. Robert Budnitz, a current member the DCISC. Dr. Budnitz stated that Dr. Peterson has outstanding qualifications with an international reputation in

⁵ See CPUC Resolution E-4657 (June 12, 2014) and CPUC Resolution E-4711 (February 26, 2015).

⁶ A link to the announcement was also sent to the service lists in A.16-03-006 and A.16-08-006. See footnote 3 above.

nuclear safety engineering. Dr. Budnitz emphasized the quality of Dr. Peterson's service on the DCISC and his work for the U.S. Government in responding to the nuclear reactor accident at Fukushima, and noted that he has been very effective in interacting with members of the public who attend DCISC meetings and take part in the DCISC-sponsored tours of the DCP. Dr. Budnitz submitted similar comments supporting Dr. Peterson in 2014.

The Alliance for Nuclear Responsibility has provided a recommendation in support of Dr. Quinn's candidacy. The Alliance not only praised his background and experience, but singled out his work on "management and human relations" and its beneficial relationship to examining and planning the potential shutdown of the DCP. Dr. Quinn previously applied to be a candidate for appointment to the DCISC in 2014 and 2015. In 2014, the Energy Division received many comments supporting his appointment. Those comments confirmed Dr. Quinn's experience, knowledge, and reputation in the field of nuclear safety. The comments described Dr. Quinn's technical skills in the field of nuclear operations and safety, his experience with the nuclear industry, his communications and leadership skills, and integrity. Those comments included a description of Dr. Quinn's leadership of a radiation protection recovery effort at the Bruce Nuclear Power Plant in Ontario, Canada, where an event had exposed plant workers to airborne radiation. According to the comments, Dr. Quinn was an excellent team leader committed to improving radiation safety standards at the Bruce plant, and his knowledge of the dynamics of a nuclear power station's operations was a key factor in the success of the project. Several of those who commented in support of Dr. Quinn's appointment in 2014 reaffirmed their support for his appointment when he re-applied in 2015.

NOTICE

Notice of this Resolution was made by publication in the CPUC's Daily Calendar. A copy of the Draft Resolution was sent to all of the applicants and to those submitting comments on their behalf. A copy of the Draft Resolution was also sent to the California Governor's office and to the service lists in PG&E's A.16-03-006 and A.16-08-006.

DISCUSSION

The restated charter adopted in D.07-01-028 requires that candidates for appointment to the DCISC be persons with knowledge, background, and experience in the field of nuclear power facilities and nuclear safety issues who demonstrate they have no conflicts of interest.⁷

Summaries of the qualifications of each applicant are included in Appendix A of this Resolution.

Dr. Per F. Peterson is qualified to continue to serve on the Diablo Canyon Independent Safety Committee.

Dr. Peterson is an incumbent member of the DCISC, having been appointed to his initial three-year term from July 2004 through June 2007 by the then Attorney General, Bill Lockyer; Dr. Peterson was appointed again in 2008 by Governor Schwarzenegger and reappointed in 2011 and 2014. In addition to serving on the DCISC, Dr. Peterson is currently the Executive Associate Dean of the UC Berkeley College of Engineering, where he has worked as a professor since 1990 teaching courses covering the theoretical and practical aspects of nuclear reactor safety. In prior years at Berkeley, he has chaired the Department of Nuclear Engineering, the Energy and Resources Group, and the Radiation Safety Committee. He is also a Fellow of the American Nuclear Society as well as chair of the Reactor Safeguards Committee for the Aerotest Research Reactor in Pleasanton, California. Dr. Peterson often serves on advisory panels for the federal government, the national laboratories, and the national academies on

⁷ Conflicts of interest guidelines are set forth in Section I.C of the restated charter. They establish limits for DCISC members on income and gifts from PG&E or an affiliated company, and investments in PG&E or an affiliate. They also prohibit members of the DCISC from attempting to use their position to influence action of the Committee in which they have a financial interest. DCISC members are required to file a Statement of Economic Interest in the same manner as designated CPUC employees. No person shall serve on the DCISC who has a prior history of supporting or opposing PG&E as a witness or intervenor in nuclear licensing or CPUC proceedings associated with the Diablo Canyon Power Plant.

topics related to nuclear technologies, as well as expert panels at academic conferences and workshops. From 2010-2012, he served as a member of President Obama's Blue Ribbon Commission on America's Nuclear Future to help provide recommendations to the Administration, Congress, and the Department of Energy on strategies to manage U.S. spent fuel and high level wastes. Dr. Peterson earned his Masters and Ph.D. degrees in Mechanical Engineering from UC Berkeley between 1985 and 1988.

Dr. Peterson has no conflicts of interest that would preclude his continuing to serve on the DCISC. His qualifications show that he has the requisite knowledge, background, and experience in the field of nuclear power plants and nuclear safety issues.

Dr. Ivan Catton is qualified to serve on the Diablo Canyon Independent Safety Committee.

Dr. Catton has spent the last five decades teaching nuclear engineering, thermodynamics, heat transfer, and fluid mechanics at UCLA, where he also took on the job as director of the UCLA nuclear reactor facility. In that time, he researched and worked on industrial applications in the field of heat transfer, ranging from aerospace systems to nuclear power plant design. His research has also examined nuclear safety issues such as core melt problems, steam explosions, BWR suppression pool loading, water hammer, steam generator tube vibration, and loose parts induced wear, among others. In his technical career with the Advisory Committee of Reactor Safeguards (ACRS), he worked on safety reviews, served as the ACRS representative at Three Mile Island during its accident and the subsequent stabilizing of the plant, provided reviews of thermal hydraulics, chaired the Thermal/Hydraulics and Fire Protection subcommittees, and helped formulate ACRS comments and recommendations on many technical issues. Additionally, Dr. Catton consulted for the Congressional Nuclear Waste Technical Review Group on Yucca Mountain, consulted for the NRC, and participated in a review of the Diablo Canyon Seismic Design. Over the course of his career, Dr. Catton has received several awards, including the Heat Transfer Memorial Award and the Max Jakob Award for excellence in heat transfer research and engineering, both from the American Society of Mechanical

Engineers. He received his bachelor's degree and Ph.D. in mechanical engineering, both from UCLA.

Dr. Catton has no conflicts of interest that would preclude his serving on the DCISC. His qualifications show that he has the requisite knowledge, background, and experience in the field of nuclear power plants and nuclear safety issues.

Dr. Michael Quinn is qualified to serve on the Diablo Canyon Independent Safety Committee.

Dr. Quinn has facilitated regulatory compliance, reliability assessments, and performance improvement in the commercial nuclear power industry since 1999, following a 25 career in the U.S. nuclear power industry. His experience includes developing and delivering root cause evaluation training to NRC staff, assessing significant issues during refueling operations at nuclear power plants, and leading root cause assessments at nuclear facilities. Dr. Quinn has also managed a team that developed and implemented corrective actions to address performance resulting in radiation contamination of several hundred workers at the Bruce Nuclear Generating Station in Ontario, Canada. He has led teams in developing, implementing, and evaluating programs to establish a safety culture at nuclear power plants. Dr. Quinn was Manager of Nuclear Planning and Operational Standards for Northeast Nuclear Energy Company, and has held positions as Radio-Chemist, and Manager of Chemistry and Radiochemistry, in addition to other positions at the Connecticut Yankee Haddam Neck Nuclear Station. Dr. Quinn has a Doctorate in Organizational Management Systems and a Masters of Business Administration degree, both from the University of New Haven, and a B.S. degree in Chemistry from Charter Oak College. He previously held a U.S. NRC Senior Reactor Operator License on a Westinghouse pressurized water reactor.

Dr. Quinn has no conflicts of interest that would preclude his serving on the DCISC. His qualifications show that he has knowledge, background, and experience in the field of nuclear power plants and nuclear safety issues.

The candidates nominated by the Commission are the most qualified candidates from the pool of applicants.

The CPUC's President, Michael Picker, has reviewed the qualifications, experience, and backgrounds of all the applicants and selected Dr. Ivan Catton, Dr. Per Peterson, and Dr. Michael Quinn for submission to the California Governor as candidates for the three-year DCISC position beginning July 1, 2017.

President Picker's selection of Dr. Ivan Catton, Dr. Per Peterson, and Dr. Michael Quinn as the candidates for the July 1, 2017 vacancy on the Diablo Canyon Independent Safety Committee is ratified.

President Picker's selection of Dr. Peterson as a candidate for reappointment, and Dr. Catton and Dr. Quinn as candidates for appointment to the DCISC for a three-year term beginning July 1, 2017 is ratified. As mentioned above, President Picker recognizes that all of the applicants possess the qualifications to competently serve on the DCISC. The President's selections shall be provided to the Governor.

COMMENTS

Public Utilities Code section 311(g)(1) generally requires resolutions to be served on all parties and be subject to at least 30 days public review and comment prior to a vote of the Commission. Accordingly, the Draft Resolution was served on parties and issued for public review and comment no later than 30 days prior to a vote of the Commission.

One comment was submitted on the Draft Resolution: on May 9, 2017, Joel Reynolds and Ralph Cavanagh, Senior Attorneys writing on behalf of the National Resources Defense Council, sent a joint letter to the Commission supporting the appointment of Dr. Michael Quinn to the DCISC. Their comments endorsed the reasons provided by the Alliance for Nuclear Responsibility in its comment letter sent on February 13, 2017, contained in Appendix B. Messrs. Reynolds' and Cavanagh's comments are likewise included in Appendix B. As their comments were not appreciably different from those received previously, no substantive changes were made to this Resolution.

FINDINGS

1. D.88-12-083 created the Diablo Canyon Independent Safety Committee (DCISC).
2. The DCISC is an independent, three-member committee responsible for monitoring the safety of PG&E's operation of the Diablo Canyon Power Plant.
3. D.07-01-028 adopted a restated charter for the DCISC including revised procedures for appointments of DCISC members.
4. On December 12, 2016, in accordance with D.07-01-028, an announcement was posted on the CPUC's website seeking applications for the July 1, 2017 vacancy on the DCISC.
5. The California Governor is the appointing authority for the July 1, 2017 vacancy on the DCISC.
6. Dr. Per Peterson, the incumbent member of the DCISC whose term expires on June 30, 2017, responded to the CPUC's December 12, 2016 announcement and consents to being a candidate for reappointment to the DCISC.
7. Dr. Ivan Catton, a professor and professional nuclear energy consultant, responded to the CPUC's December 12, 2016 announcement, and submitted an application to be considered as a candidate for appointment to the DCISC.
8. Dr. Michael Quinn, a professional nuclear energy consultant, responded to the CPUC's December 12, 2016 announcement, and submitted an application to be considered as a candidate for appointment to the DCISC.
9. The CPUC invited comments on Dr. Peterson's, Dr. Catton's, and Dr. Quinn's qualifications in an announcement posted on the CPUC's website on February 6, 2017.
10. Comments supporting the appointment of Dr. Peterson and Dr. Quinn to the DCISC were received in response to the CPUC's February 6, 2017 announcement inviting comments.

11. The CPUC's President, Michael Picker, has reviewed the qualifications, experience, and backgrounds of Dr. Peterson, Dr. Catton, and Dr. Quinn.
12. Dr. Peterson, Dr. Catton, and Dr. Quinn have knowledge, background, and experience in the field of nuclear power plants and nuclear safety issues, and are qualified candidates for appointment to the DCISC.
13. President Picker has chosen to provide the names of Dr. Peterson as a candidate for reappointment, and Dr. Catton and Dr. Quinn as candidates for appointment to the DCISC for a three-year term beginning July 1, 2017.
14. President Picker's selection of Dr. Peterson, Dr. Catton, and Dr. Quinn as the candidates for appointment to the DCISC for a three-year term beginning July 1, 2017 should be ratified and provided to the California Governor.

THEREFORE IT IS ORDERED THAT:

1. President Picker's selection of Dr. Peterson, Dr. Catton, and Dr. Quinn as qualified candidates for consideration by the California Governor for appointment to the Diablo Canyon Independent Safety Committee for a three-year term beginning July 1, 2017 is hereby ratified.

This Resolution is effective today.

I certify that the foregoing resolution was duly introduced, passed and adopted at a conference of the Public Utilities Commission of the State of California held on June 15, 2017; the following Commissioners voting favorably thereon:

/s/ TIMOTHY J. SULLIVAN
TIMOTHY J. SULLIVAN
Executive Director

MICHAEL PICKER

President

CARLA J. PETERMAN

LIANE M. RANDOLPH

MARTHA GUZMAN ACEVES

CLIFFORD RECHTSCHAFFEN

Commissioners

APPENDIX A

The following statements were supplied by the applicants as part of the application process and were available for public review and comment starting on February 6, 2017. The assertions of fact contained within these statements have not been disputed. These statements are provided verbatim.

Qualifications of Dr. Per F. Peterson (Incumbent)

Per F. Peterson is a professor in the Department of Nuclear Engineering at UC Berkeley. Prior to beginning graduate studies in 1985, he worked at Bechtel National on the design of the Defense Waste Processing Facility that now operates at the Savannah River Plant (South Carolina) to vitrify defense wastes. After completing Masters and PhD degrees in Mechanical Engineering at UC Berkeley between 1985 and 1988, studying passive heat transfer processes, he performed postdoctoral work at the Tokyo Institute of Technology, and was hired as an Assistant Professor at UC Berkeley in Nuclear Engineering in 1990. At Berkeley he has taught extensively in courses related to reactor design and safety. This includes the undergraduate courses NE-161: Nuclear Power Engineering and NE-170: Nuclear Design, as well as the graduate courses NE-260: Thermal Aspects of Nuclear Reactors, NE-267: Nuclear Reactor Safety, and NE-275: Risk Assessment. These courses cover all theoretical and practical aspects of nuclear reactor safety.

His research and publications cover both applied and fundamental topics related to nuclear technology. This work and some 300 research publications have covered topics in nuclear fusion energy, fission reactor design and safety analysis, nuclear waste management, and fundamental topics in heat transfer and fluid mechanics that are relevant to these applications. He is frequently called upon to serve on advisory panels for the federal government, the national laboratories and the national academies on topics related to nuclear technologies, as well as expert panels at academic conferences and workshops.

From 2010 – 2012, Peterson served as a member of President Obama’s Blue Ribbon Commission (BRC) on America’s Nuclear Future, where he co-chaired its Reactor and Fuel Cycle Technology subcommittee with retired Senator Pete Domenici. The BRC provided recommendations to the Administration, Congress, and the DOE on strategies to manage U.S. spent fuel and high level wastes. These recommendations have clear relevance to California, including defining the national approach to manage used fuel left at decommissioned reactor sites that include Rancho Seco, Humboldt Bay, and San Onofre in California.

He is also currently Executive Associate Dean of the College of Engineering, and is a former chair of the Department of Nuclear Engineering and of the Energy and Resources Group, at UC Berkeley. He is a Fellow of the American Nuclear Society and a former chair of its Thermal Hydraulics Division. He previously chaired the Radiation Safety Committee for UC Berkeley, which is regulated by the California Department of Public Health and is responsible for reviewing all authorizations for radioactive materials and radiation producing machines used in research on the Berkeley campus, and he is chair of the Reactor Safeguards Committee for the Aerotest Research Reactor in Pleasanton, California. In 2004, he was appointed to the Diablo Canyon Independent Safety Committee by the Attorney General and served until 2007; he was appointed to the Committee again in 2008 by the Governor and re-appointed in 2011 and 2014.

Qualifications of Dr. Ivan Catton

Professor Catton began his teaching career at UCLA in 1967 where his major areas of teaching and research were thermodynamics, heat transfer, and fluid mechanics. In 1974 he became a consultant to the Advisory Committee on Reactor Safeguards (ACRS) at the request of Professor David Okrent (the father of probabilistic safety analysis). To gain the requisite knowledge of nuclear reactor plants, Professor Catton taught every undergraduate nuclear engineering course given at UCLA and took on the job of director of the UCLA nuclear reactor facility where he was responsible for teaching and licensing many UCLA students to operate the UCLA Nuclear Reactor.

Prof. Catton's career spans more than fifty years in both research and industrial applications in the field of heat transfer, ranging from aerospace systems to electronic devices and nuclear power plant design. In 1981, he received the Heat Transfer Memorial Award from the American Society of Mechanical Engineers (ASME), one of the most prestigious awards in the field. In 2009, he received the Max Jakob Award from ASME and the American Institute of Chemical Engineers for excellence in heat transfer research and engineering. Dr. Catton has been involved in the study and design of nuclear power plants, water desalination plants, use of solar power, aerospace heat transfer for re-entry vehicles, and - more recently - optimum design of heat exchangers.

Prof. Catton spent most of his technical career as either a consultant to or a member of the ACRS, an advisory committee to the commissioners of the U.S. Nuclear Regulatory Commission (NRC). This experience began with the safety review of the CRBR where liquid metal heat transfer was the focus of his efforts, followed with BWR suppression pool problems related to the LOCA. He was the ACRS representative at Three Mile Island (site 2) during the accident and subsequent stabilizing of the plant. Severe accidents then became important and he and his colleagues at UCLA gave technical assistance to the NRC in this area. With Prof. Okrent's arrival at UCLA, Prof. Catton became more involved with licensing issues at various nuclear power plants around the country. All aspects of nuclear power came under the auspices of the ACRS and in this capacity Prof. Catton consulted on a large number of plant-specific subcommittees.

Prof. Catton's research in the nuclear safety area has dealt with core melt problems and steam explosions, BWR suppression pool loading, water hammer, steam generator tube vibration, and loose parts induced wear among others. More recent nuclear research activities were in two areas. The first area was the result of a study supported by the NRC on Accident Management which resulted in several publications including an invited paper in Nuclear Engineering and Design, and an invitation by the International Atomic Energy Committee to evaluate the Krsko nuclear power plant accident management program. The second area of study was steam generator tube vibration and loose parts wear. This work extended the state of the art in vibration prediction for single phase flow over tube bundles by predicting the onset of vibration

without resorting to use of experimental data, a first for rod bundles. An invited paper appeared in Nuclear Engineering and Design that summarizes this work where results for two-phase flow were also included. Another paper in the same journal addresses the issue of dry out and heat up of a reactor core following a severe accident. This work placed UCLA at the forefront of nuclear power plant severe accident research, culminating with Dr. Catton being named general chairman of the sixth International Post Accident Heat Removal Information Meeting held at UCLA in 1986 and co-chair of a similar meeting held in Dubrovnik in 1989.

During 1988, Dr. Catton participated in an effort to establish the uncertainty in calculated reactor system behavior following a major loss of coolant accident. The results of this work led to five publications in Nuclear Engineering and Design. Prof. Catton's group brought together the results of a \$1.5B research program spanning a fifteen year period. The work underwent peer review by eminent researchers and was judged to be the first of its kind. A second such study addressing severe accidents (which led to elimination of the DCH issue) was initiated by the NRC, but Prof. Catton's appointment to the ACRS limited his involvement to oversight. Dr. Catton was the ACRS representative to the Steam Generator, Safety Stop Valve and Check Valve Owner Groups. As an independent consultant following his ACRS membership, Dr. Catton addressed issues like core axial power distribution and erosion of shutdown margin (SDM) attributing to crud buildup on the nuclear fuel and subsequent boron deposition in the crud layer, and steam generator tube vibration at SONGS.

Prof. Catton became a member of the ACRS in 1989 and served until of 1997. Any safety issue arising in the nuclear industry is within the charter of the ACRS and every licensed plant must have an ACRS letter of review. Prof. Catton's area of responsibility on the committee was thermal hydraulics where he was instrumental in moving the industry towards the use of best estimate computational tools and played a strong role in the licensing of the new Westinghouse passive nuclear reactor (AP600). He was also a member of the Savannah River Laboratory Severe Accident Advisory Panel where he reviewed all severe accident-related work.

While an ACRS member, Professor Catton was chairman of the Thermal/Hydraulics and Fire Protection subcommittees, and a member of the Severe Accidents, PRA, and Human Factors subcommittees. He was instrumental in formulating ACRS comments and recommendations on a number of LWR technical issues, including:

- Post TMI-2 lessons learned review;
- Advanced code development (RELAP5 and TRAC) ;
- Determination of the uncertainties in best estimate calculations of LOCAs (CSAU);
- Sump screen and suction strainer blockage issues at LWR plants;
- Post-accident level monitoring in LWRs;
- Development of a regulatory guide on instrumentation to follow the course of an accident;
- Steam generator overfill, multiple tube rupture, and the Steam Generator Rule;

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- Chilled water system reliability and pump seal issues;
- AP600, ABWR, SBWR and CE System 80+ DBAs, Fire protection and Severe Accidents;
- Review of the EPRI ALWR Utility Requirements Document;
- Risk-Based Fire Protection Rule and resolution of the Thermo-Lag Fire Barrier Issue;
- NRC Standard Review Plan for risk-based regulation; and
- Westinghouse Best Estimate LOCA methodology and Simulator fidelity.

Following his service on the ACRS, Professor Catton became a consultant to the Congressional Nuclear Waste Technical Review Group to help in evaluating the use of various means of predicting the long term evolution of stored waste at Yucca Mountain. He was also a consultant to the NRC on the impact of SBLOCA on PTS and to EPRI on the crud/boron issue, he participated in a review of the Diablo Canyon Seismic Design, and attended the final ACRS subcommittee meeting held at San Luis Obispo High School.

Professor Catton's broad range of experience will enable him to effectively serve on the Diablo Canyon Independent Safety Committee.

Qualifications of Dr. Michael D. Quinn

Dr. Quinn has invested over forty years into the public health and safety of nuclear industry operations, including twenty-five years in power block operations at a nuclear power station, and the past sixteen years as a consultant to the nuclear industry in the U.S. and Canada. Michael's collective past and currently applied nuclear power experience is congruent with the Diablo Canyon Independent Safety Committee's (DCISC) requirements and mission. He can bring current, comprehensive nuclear operations assessment experience to complement the depth and breadth of the Committee's members.

Equally important as his applied operational experience and academic background, Dr. Quinn can bring to the DCISC a demonstrated history of articulating his assessments in an objective, empirically based, and plain language manner to the full spectrum of stakeholders (e.g., the public, interest groups, station staff, the boardroom, utility commissions, and regulators, among others).

1975-1999 Qualification Experience

While in the power block of a nuclear unit with a large nuclear utility from 1975 to 1999, Michael earned a U.S. Nuclear Regulatory Commission (NRC) Senior Reactor Operator License on a Pressurized Water Reactor unit (PWR), and held leadership positions that included Director of Nuclear Station Services; Nuclear Plant Operations Review Committee (PORC) and Corrective Action Review Board (CARB) Chair and Member; Director of Nuclear Station Emergency Operations; Refueling and Maintenance Outage Shift Manager; Nuclear Station Duty Officer; Manager of Chemistry and Radiochemistry; and Project Manager, reporting to the President, on a three-unit, four year Station Recovery Team.

During this time, Michael was part of, and frequently at the center of, many documented nuclear station challenges and operational evolutions, planned and unplanned. Michael was a member of the senior station leadership team at Haddam Neck Station, a nuclear unit that continuously performed at NRC SALP-1 and INPO-1 performance levels (presently termed US NRC Column 1 and INPO-1).

1999-2017 Qualification Experience

Since 1999 Michael has been engaged in the safe operation of nuclear units, as well as in the new build, refurbishment, and decommissioning sectors of the nuclear industry while consulting to more than two dozen nuclear units and facilities in the U.S. and Canada, often in the power block.

During these past sixteen-plus years, Michael has been, and is presently: conducting station and licensee program and operational assessments on operational aspects of nuclear organizations;

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performing root cause evaluation on significant events; and leading recovery project management for nuclear licensees and suppliers.

In addition, Dr. Quinn continues to assess and remediate licensee and supplier organizational and corrective action programs; provides PI&R, Human Performance, and Safety Culture coaching and training; and provides related consulting services to several nuclear industry sectors. These sectors include the commercial nuclear power industry in the U.S. and Canada; U.S. Government (e.g., NRC, U.S. Department of Energy); and nuclear supplier organizations (large nuclear steam supply system providers as well as smaller nuclear suppliers to the new builds in South Carolina and Georgia).

Selected nuclear safety and culture issues that Dr. Quinn has successfully dealt with include: significant safety issues in a high-level trans-uranic nuclear waste underground facility; consequential design phase issues on the 'new build' project for North Anna 3; significant safety issues on the disassembly and reassembly of components on two CANDU reactors under refurbishment; Loss of Offsite Power to the Operations power block of a 1200 MWe nuclear unit; nuclear fuel handling project upgrade failures at five separate nuclear sites involving distinctly different failures during a four month refueling season; a Nuclear unit cooling tower failure; team member of a reliability assessment of Vermont Yankee; Collective Significance assessment on six safety systems' performance challenges at a PWR; causal analysis of safety related flow control valve erratic operation; Collective Significance on Spent Fuel Transfer issues at a decommissioning station; Collective Significance of five nuclear fuel handling project upgrade failures; components that did not meet acceptance criteria at each of the four 'new build' nuclear units in SC and GA; significant transuranic (alpha) ingestion/ uptake by over 500 craft workers at a nuclear power station; technical, radiological, and safety culture issues significantly impacting a Decontamination and Decommissioning (D&D) campaign at a waste recovery site.

From a major nuclear industry 'campaign' perspective, Dr. Quinn has been and is still engaged in industry issue campaigns and challenges that include: safety culture challenges to nuclear operations; post-accident industry response and subsequent upgrades; containment sump screen upgrade (GSI-191); groundwater tritium; safeguards; nuclear fuel handling; Independent Spent Fuel Storage Installations (ISFSI); uptake of trans-uranics to workers; corrective action program challenges, notably 10 CFR 50 Appendix B Criteria; Nuclear Promise Efficiency Bulletins; and no less importantly, the impact that a 'final shutdown decision' (as Diablo Canyon is facing within eight years) has had on nuclear station staffs' performance while trying to maintain focus on operational excellence.

Michael has led numerous nuclear organizational assessments (and, in several cases, recoveries), and has also responded to a large number of programmatic breakdowns that have impacted Conduct of Nuclear Operations, Safety Culture, Corrective Action Programs, equipment operability, training programs, and management/personnel effectiveness at nuclear units.

Starting in 2006 and continuing into 2017, Dr. Quinn has trained NRC inspectors and technical staff in a concentrated three-day course on the selection and engagement of assessment tools and processes to evaluate significant nuclear licensee event and incident reports. During these past ten years he has trained over 600 inspectors and technical staff. In late February 2017, Dr. Quinn will provide this three-day assessment training to the first cohort from the Japan Nuclear Regulation Authority.

LICENSES/ CERTIFICATIONS CONTRIBUTORY TO A POTENTIAL POSITION ON THE DCISC:

- U.S. NRC Senior Reactor Operator License #10071 (now inactive) on a Westinghouse PWR (Diablo Canyon is a Westinghouse PWR design)
- Certified Root Cause Investigator:
 - Nuclear Safety Review Concepts Event Evaluation
 - FPI/ PII Prevention/ Reduction of Organizational & Programmatic Failures
- Certified Root Cause Trainer
- Certified Radiation Safety Officer

Dr. Quinn earned a Doctorate in Organizational Management Systems (organizational system dynamics) and Executive Master of Business Administration degrees from the University of New Haven. He had previously earned a Bachelor of Science degree in Chemistry from Charter Oak College.

In summary, Michael brings directly applicable past and current nuclear industry analysis experience and assessment results for your consideration of his candidacy regarding an appointment to the Diablo Canyon Independent Safety Committee.

LinkedIn:

<https://www.linkedin.com/in/quinnmd>

END OF APPENDIX A

APPENDIX B

The following are all of the public comments submitted regarding the applicants for the Diablo Canyon Independent Safety Committee. The comments are presented in chronological order and are provided verbatim.

Robert J. Budnitz
734 The Alameda
Berkeley CA 94707
home telephone (510)527-9775
email: budnitz @ pacbell.net

13 February 2017

David Zizmor
Energy Division, California Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102
david.zizmor@cpuc.ca.gov

SUBJECT: Letter in support of Per F. Peterson, DCISC

[Although I am currently a member of the Diablo Canyon Independent Safety Committee, this letter is being written by me personally and is not related to my DCISC affiliation. In fact, nobody else associated with the DCISC knows that I am writing this letter.]

I am writing this letter to support the reappointment of Per F. Peterson to the Diablo Canyon Independent Safety Committee (DCISC). I am currently a member of the DCISC and have been a member since mid-2007, when I was appointed to a 3-year term by then-Attorney General Brown. I was reappointed by AG Brown for another term in mid-2010, and reappointed again in mid-2016 by Attorney General Harris.

Per Peterson was a DCISC member from 2004 to 2007, appointed by former Attorney General Lockyer. He then served three more three-year terms (2008 to 2011, 2011 to 2014, and 2014 to the present), these after having been appointed by Governor Schwarzenegger and most recently (2014) by Governor Brown. His current term will end in June 2017, and he is now up for reappointment again.

Professor Peterson's qualifications are outstanding. He currently holds the William and Jean McCallum Floyd Endowed Chair as a professor of nuclear engineering in the Department of Nuclear Engineering at UC-Berkeley, which incidentally is the only such NE department at any university in the State of California. He has served twice as that department's chairman. He is also currently the Executive Associate Dean of Engineering.

Per Peterson has an international reputation in nuclear safety engineering — he is one of the outstanding experts in nuclear power plant safety. He has published widely, and he is also famous as a leading nuclear-engineering educator. His publications and influence in the field are very broadly recognized

as first-rate. He was also honored when, in 2010, he was asked to serve on President Obama's "Blue Ribbon Commission on American's Nuclear Future," established to provide technical and policy advice to the administration and the Congress on long-term policies to assure that nuclear energy's future both domestically and abroad is as safe and as proliferation-resistant as it needs to be. He served with distinction on that Commission through publication of its final report in 2012.

In 2011, in the immediate aftermath of the tsunami-caused nuclear reactor accident at Fukushima, Japan, Dr. Peterson was asked by the U.S. Secretary of Energy, Dr. Steven Chu, to serve on a small *ad hoc* 5-member "science advisory team" that advised on how best the U.S. Government as a whole should respond with its resources to assist the Japanese in understanding the accident, securing the safety of the installation, and assuring the safety of the nearby populations. This assignment, which lasted for about 6 months, was at the highest level and advised the entire U.S. Government, including the White House, the Office of the President's Science Adviser, the military, and the U.S. Nuclear Regulatory Commission. (I was honored to be another of the 5 members of this special "science advisory team.") Dr. Peterson's outstanding knowledge, sound critical thinking, and keen advice played a major role in helping to assure that the U.S. Government as a whole provided the best available advice and equipment to assist the Japanese. I saw this first-hand, because I was another member of that small advisory group.

I have known Per Peterson for many years, but in this note I wish mainly to emphasize the excellent quality of his service with me on the DCISC. He has brought strong experience in nuclear safety, and a very broad knowledge of how nuclear plants work and how safety is achieved. He is 100-percent impartial in his judgments. He has been very effective in interacting with members of the general public who attend our DCISC public meetings, who go on our DCISC-sponsored tours of the Diablo Canyon power plant, and who write letters to the DCISC on various matters. He also has an excellent understanding of how a review committee like the DCISC can be most effective in carrying out its mission of helping to inform the State of California about the safety of the power plant at Diablo Canyon.

His service on the DCISC has been exemplary. In my view, his reappointment to the DCISC would be a great service to the citizens of California, and I strongly urge it.

Sincerely,



[original signed by Robert J. Budnitz]

June 15, 2017



ALLIANCE FOR NUCLEAR RESPONSIBILITY

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February 13, 2017

David Zizmor
California Public Utilities Commission
505 Van Ness Avenue
Energy Division, Fourth Floor
San Francisco, CA 94102

Via email: david.zizmor@cpuc.ca.gov

Re: Diablo Canyon Independent Safety Committee
Appointment of Dr. Michael Quinn—SUPPORT

Dear Mr. Zizmor:

The Alliance for Nuclear Responsibility would like to support the appointment of Dr. Michael Quinn to the Diablo Canyon Independent Safety Committee (DCISC).

The Alliance's mission includes monitoring ratepayer investments to improve safety and mitigate environmental damage from the operation of the state's last aging reactor. This past year brought the announcement of PG&E's intent to retire Diablo Canyon at the end of its current license (2025), subject to CPUC approval. As such, a new level of concern arises, because there are so few precedents for such a long-term shutdown plan. Among those issues would be:

- Will PG&E maintain the required level of capital improvement and maintenance needed for the remaining years?
- How will workforce morale and diligence be maintained?
- How and who will monitor the NRC's oversight with regards to waivers that may or may not be issued for repairs and upgrades, given the shortened plant life?

While it is true that all the candidates show strong backgrounds and work experience with nuclear science and technology, it was Dr. Quinn's resume that caught our attention. In addition numerous technical positions (including "NRC senior reactor operator license") his career features additional areas of concentration (as was the focus of his Ph.D) in *the management and human relations*

aspects of operating complex, technical systems. As such, *only his* curriculum vitae acknowledges this changed situation for Diablo Canyon:

“From a major nuclear industry ‘campaign’ perspective, Dr. Quinn has been and is still engaged in industry issue campaigns and challenges that include: safety culture challenges to nuclear operations....[a]nd no less importantly, the impact that a ‘final shutdown decision’ (as Diablo Canyon is facing within eight years) has had on nuclear station staffs’ performance while trying to maintain focus on operational excellence.”

[emphasis added]

Of all the current candidates, his recognition of Diablo’s changed status is unique, and we believe a valuable insight into his thought process and expertise. To date, current DCISC member Dr. Robert Budnitz has been the most forceful voice publicly raising the troubling concerns enumerated in the bullet-pointed paragraph above; current chairman Dr. Peter Lam has also raised questions regarding PG&E’s “excellence and investing” plans. It would be beneficial in addressing the public’s questions to see *unanimous* concern for this issue by the DCISC.

The human performance aspects of nuclear power operations are likely to be looming as large (or larger) than the solely technical considerations in these final countdown years. The experiences of a candidate such as Dr. Quinn in identifying and working to mitigate any shortcomings that could impact reactor operations and public safety would be welcomed by ratepayers and stakeholders alike.

The Alliance for Nuclear Responsibility endorses Dr. Michael Quinn for appointment to the Diablo Canyon Independent Safety Committee.

Yours truly,

/s/

Rochelle Becker
Executive Director
Alliance for Nuclear Responsibility

June 15, 2017

NRDC

May 9, 2017

David Zizmor
California Public Utilities Commission
505 Van Ness Avenue
Energy Division, Fourth Floor
San Francisco, CA 94102

Via e-mail: david.zizmor@cpuc.ca.gov

Re: Diablo Canyon Independent Safety Committee
Appointment of Dr. Michael Quinn – SUPPORT

Dear Mr. Zizmor:

On behalf of the Natural Resources Defense Council and its 2.4 million members and activists, and for the reasons stated in the February 13, 2017 letter submitted by Rochelle Becker on behalf of the Alliance for Nuclear Responsibility (attached to Draft Resolution E-4849), we are pleased to write in support of the appointment of Dr. Michael Quinn to the Diablo Canyon Independent Safety Committee.

Very truly yours,



Joel Reynolds
Western Director
Senior Attorney

Ralph Cavanagh
Director, Energy Program
Senior Attorney

Cc: Rochelle Becker

NATURAL RESOURCES DEFENSE COUNCIL

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END OF APPENDIX B